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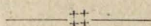
# UNIVERSITY OF CALIFORNIA.

## AGRICULTURAL EXPERIMENT STATION.

BERKELEY, CAL.

E. W. HILGARD, Director.

BULLETIN NO. 84.



### DISTRIBUTION OF SEEDS AND PLANTS.

The distribution of plants and seeds from this Station during the winter of 1889 was much greater in amount of material and much wider geographically than in any previous year since the work was undertaken. Through unfortunate announcements in a few Eastern agricultural papers, we were deluged with applications from distant States that our available material was wholly inadequate to supply. The labor of acknowledging such applications and returning remittances was something of a burden upon our clerical force. We desire, therefore, to state plainly this year that we cannot undertake to fill applications from those resident in other States than California, except such exchanges as seem to us desirable with other Experiment Stations and occasionally with individuals.

The total number of individual applications received last winter was 1060, of which 994 were filled, wholly or in part. Every county of California was reached, except two small mountain counties, and the extent of the distribution can also be inferred from the fact that packages addressed to applicants were sent to nearly one-half of all the postoffices in the State. The actual cost of the distribution to recipients was \$268.04, which nearly covered packing, postage, etc.; the labor of producing and gathering the seed, and, in a few cases, the cost of purchasing supplies was paid for from the University funds.

*Reports from Recipients.*—Those who receive seeds and plants are expected to report results

to us, that the data may be embodied in our publications. A large number of such reports is now being prepared for printing, and we earnestly request those who have not yet complied with our desires in this respect to do so at once. We wish to hear of failures as well as successes, that the exact standing of each plant may be ascertained. In reporting failures, please state from what apparent cause, if possible.

*Terms.*—As there is no appropriation available to meet the expenses of packing and postage, applicants are requested to send the amount specified in connection with each description below. If they desire seeds sent by express, applicants need not send the amounts specified for postage; *but all orders for SEEDS by express must be accompanied by a remittance of ten cents to pay for packing.* Applications may be made for one or more kinds of seeds; *but an applicant should not order more than one package of a kind.* In case any kind of seed becomes exhausted, the money sent will be returned unless a second choice is mentioned by the sender.

PLANTS will be forwarded by express (*charges to be paid by receiver*) in lots consisting of the number hereinafter mentioned for each kind, on remittance of 25 cents for one lot of plants, and where more than one kind is ordered, ten cents additional for each additional lot, to pay expenses of packing, etc. Postal notes are requested instead of stamps whenever practicable. Any surplus left after filling or-



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ders will, as far as possible, be returned to the senders, deducting letter postage.

#### PLANTS AND TREES.

*Kai Apple (Aberia Caffra).*—The Kai apple is a native of Natal and Caffaria. It is a tall shrub, yielding an edible fruit of a golden yellow color, about the size of a small apple. It is commended as a hedge plant, as it is densely clothed with strong dry spines. The leaves are small and of a rich green hue. The fruit is chiefly used for making preserves. We gained the seed as a donation from Mr. Thomas Hanbury, an amateur, whose gardens at La Martola, Italy, are especially rich in rare growths. The plant grows readily from seed, but can also be multiplied rapidly by cuttings, using bottom heat. In this way plants can be secured for hedge-planting without waiting for the stock plant to reach bearing age. We send by express two plants to each applicant: 25c.

*Caper bush (Capparis spinosa).*—It is possible that the production of the "capers" of commerce, which are the pickled flower buds of this plant, may become one of our minor agricultural industries. We have grown the plant for a number of years and it proves to be quite hardy, and this is the experience of growers in other parts of the State. It is a free bloomer with us from June to October; the flowers are strikingly beautiful and the foliage attractive. It is of low habit, and plants should be set at least six feet apart. A few plants should be grown in every garden both for use and ornament. It is propagated from cuttings under glass, but growth from the seed is easier. Three plants to each applicant by express: 25c.

*English Oak (Quercus robur, var. pedunculata).*—Each year furnishes additional evidence of the exceedingly rapid and satisfactory growth of this tree in California. Data sustaining these statements will appear in our forthcoming report. It can be earnestly commended for planting in most parts of the State both upon lawns and in forest plantations. We sent out last year 8-ounce packages of acorns. If acorns are planted in permanent place and properly guarded, they give, as a rule, very satisfactory results. Transplanted seedlings are not so likely to succeed. As some, however, prefer trees, we offer this year one-year-old trees by express, five to each applicant: 25c. Young trees should be guarded from gophers, squirrels and cattle—all these animals eat them greedily.

#### CUTTINGS AND SCIONS.

*Osier Willows.*—The price paid for basket willows in San Francisco seems to justify a somewhat larger production, though of course the limited demand could be quickly over-

and for other home purposes make a few plants desirable on almost every farm where conditions favor their growth. Osiers also make serviceable hedges, which may be strengthened by interweaving the branches. We recently received through the Forestry Division of the U. S. Department of Agriculture a collection of the best European osiers from the grounds of Heinrich Ritter von Manner, a prominent grower of osiers in Austria. These varieties have grown thriftily in our garden and will furnish cuttings for distribution of the following named sorts:

No. 1: "Smooth Golden" (*Salix viminalis*)—rather a small, slim growth; bark smooth, bright yellow.

No. 2: "Belgian" (*S. viminalis*)—a stronger grower; bark greenish yellow.

No. 3: "Hybrid Viminalis" (*S. viminalis* var ?)—very long canes; bark greenish yellow.

No. 4: "Improved Viminalis" (*S. viminalis meliorata*)—medium growth; bark greenish yellow.

No. 5: "Noble Viminalis" (*S. viminalis nobilis*)—a strong grower; bark greenish yellow.

No. 6: "Broad-leaved almond willow" (*S. amygdalina latifolia*)—rather a small cane with broad leaf; bark dark green; wood hard.

No. 7: "Yellow-branch almond willow" (*S. amygdalina vitellina*)—bark dark green.

No. 8: "Caucasian almond willow" (*S. amygdalina Caucasica*)—bark black or very dark.

No. 9: "Silver-leaf willow" (*S. hippophaefolia*)—a strong grower, with reddish bark.

Our supplies of several of these willows will be small this year, but cuttings will be sent as long as the material lasts. Sent in lots of 10 of a kind; 10c. per lot, or one dozen assorted, 20c. by mail.

*Mulberries.*—Cuttings of the following kinds can be had: (1) Multicaulis; (2) Alba; (3) Russian; (4) Downing's Ever-bearing; (5) Lhooc; (6) Nagasaki. Sent in lots of 10 of a kind; 10c. per lot, or 12 cuttings assorted, 20c. by mail.

*Resistant Grape Vines.*—Cuttings of the following species of *Vitis* can be had: (1) Cinerea; (2) Aestivalis; (3) Cordifolia; (4) Candicans; (5) Riparia; (6) Arizonica; (7) Californica; (8) Monticola; (9) Novo-Mexicana; (10) Rupestris; (11) Vulpina; (12) Romaneti; (13) Spino-vitis Davidii. Sent in lots of 10 of a kind; 10c. per lot, or a dozen assorted, 20c. by mail.

*Fruit Tree Scions.*—The University orchard contains upward of 500 named varieties of fruit, and our report of 1886 contains, on pages 130 to 140, tables in which are succinctly recorded observations on apricots, apples and pears, growth of tree and quality of fruit, time of ripening, keeping quality, etc. These observations cover a series of years and indicate that some varieties are worth a trial in other parts of the State. Applicants may order any of the varieties named in the report. We do not furnish rooted trees, but scions for grafting. We do not send large quantities of any one variety.



because the object is to test varieties and not to furnish material for commercial propagation. Send 10c. for each dozen ordered.

#### GRASSES AND FORAGE PLANTS.

*Japanese Wheat Grass (Agropyrum Japonicum, Vasey).*—This new grass, which we recently obtained from New Zealand and distributed for the first time last year, has maintained its reputation as a strong-growing, drouth-resisting grass. We could not supply more than half the applications for seed received last year, nor is it likely that this year's supply will be adequate. We have, however, sown larger area and shall continue the production until the demand is met. It is a strong and vigorous grower, stooling rapidly and abundantly, but little affected by drouth, and exceedingly hardy, producing a reasonable growth all the year round. One plot sown in January, 1889, made a good stand and covered the ground perfectly, and yielded a heavy crop of seed in August without irrigation. After cutting, the grass was given one irrigation and the second growth started at once and is now (Dec. 1) in full head again. It has been wholly unaffected by frosts which have seared more tender grasses. The growth of the grass is stocky and leafy, but not tall. It seeds freely and growers can soon provide themselves with seed from a small garden-bed, in which we advise them to sow it at first. We will send the seed in 2-oz. packets at 2c. each.

*Other Forage Plants.*—We are constantly receiving applications for grasses and forage plants of which we have made a special feature in previous distributions, because of their apparent adaptation to California conditions. Testimony of their value will be given in our next report, and we desire to hear the results of longer trials by those who received them in former years. Some of these grasses can now be purchased in quantities to suit from the seedsmen, but we still offer small parcels by mail to experimenters, as follows:

Schrader's Brome grass (*Bromus unioloides*), 8-oz. packages, 6c.

Hungarian Brome grass (*Bromus inermis*), 4-oz. packages, 4c.

Hairy-Flowered Paspalum (*Paspalum dilatatum*), 2-oz. packages, 2c.

Millet grass (*Milium multiflorum*), 2-oz. packages, 2c.

Snail clover (*Medicago turbinata*), 4-oz. packages, 4c.

Esparcet or Sainfoin (*Onobrychis sativa*), 4-oz. packages, 4c.

Jersey Kale—a tall-growing collard producing a vast weight of feed on moist land. Plants should be grown and set out like cabbages. 2-oz. packages, 2c.

Kaffir Corn.—This variety of sorghum has given good results for cutting and carrying to cattle. We have two varieties: No. 1, "White

Kaffir Corn;" No. 2, "Red Kaffir Corn." The red sort seems better adapted to the coast climate than the white. 4-oz. packages, 4c. each.

#### CEREALS.

*Hardy Productive Wheats.*—The experiments which have been continued for several years at this station to test the resistance of grain varieties to the Hessian fly, have shown us not only that several wheat varieties are practically resistant, but apparently the strong growth which possibly resists the insect, gives the varieties claim to trial as hardy, productive sorts, even in localities not visited by the Hessian fly. Of all the wheat varieties sown last spring at our outlying stations, these made the best growth and bore a good crop in spite of late sowing and drouth. These wheats all have solid stems, the straw being filled with pith. They all belong to the hard wheat type (*Triticum durum*), having rather long, pointed grains, and when introduced were almost translucent, and horny, owing to their richness in gluten; but since their introduction in this State they have rapidly changed in this respect and become starchy. These wheats are chiefly grown in the countries bordering upon the Mediterranean and the Black Sea. They do not succeed in the north of Europe, nor are they of much account even in the middle of France. They are, however, quite hardy and productive in California, and with the change in their character noted above, promise to be of considerable value. The varieties we offer are as follows:

No. 1, "Atlanti;" No. 2, "Petali;" No. 3, "Palestine;" No. 4, "Missoyen." Seeds in 1-lb. sacks, 12c. each by mail. Application may be made for one or more varieties.

*Berkeley Hybrid Barley.*—Several years ago two heads were noticed in a plot of Scotch 2-rowed barley, which differed from that variety by absence of beards, and in having spoon-like appendages like the Nepaul barley, from which it also differs in being distinctly 2-rowed and having the husk adhering to the kernel. This variety has been grown year after year, a continued effort being made to fix the type by eliminating all heads showing beards, and those exhibiting a tendency to become 4-rowed. In cleaning the seed, naked kernels have been removed as far as possible. The result is an approximation toward a fixed type which shall have the slender, leafy stem of the Scotch 2-rowed, but beardless, and with adhering husk. The primary object of the effort to fix this type has been to secure a variety suitable for hay like the Nepaul, but less liable to rust than that sort. For convenience this variety has been called Berkeley Hybrid Barley, and it is now desired to have it more widely tested to determine its hay-value and behavior in regions



subject to rust. Seed in 1-lb. sacks 12c. each, by mail.

#### BEE PASTURAGE.

*Chapman's Honey Plant* (*Echinops Sphaerocephalus*).—This species of "Globe thistle" known as the "great globe thistle" was sent us two years ago as "Chapman's Honey Plant" by the Department of Agriculture. Some other species of the genus *Echinops* are grown as ornamental plants. The name "globe thistle" comes from the bristly, round heads protected in every direction by spines; also from the thistle-like spiny leaves which the plant bears. The plant is a perennial, erect, branching herb, and in our garden, in rather moist, heavy soil, has grown from four to six feet or more in height. It blooms the second year from the seed, the light-blue flowers being very abundant in this locality from the middle of July to the last of August. During the blooming season the flower heads were almost black with bees, which must have come from long distances, as there are few swarms in the immediate vicinity. We have had no means of determining the character of the honey gathered. We apprehend that the plant might become an unwelcome weed in cultivated regions, but on wild lands might prove valuable to bee-keepers. For such use we would like to have it tested. The plant grows readily from seed, which can be "scratched in" after the heavy rains are over. Seed in 4-oz. packets, 4c. each, by mail.

#### FIBER PLANTS.

The possible fiber production in this State, as elsewhere, still awaits the effective assistance of the inventor and the capitalist. There is now a proposition advocated by leading Eastern industrialists to memorialize Congress to offer premiums and bounties with an idea of promoting this industry in order that the vast amount of money now paid for imported raw fiber and coarse fabrics may be retained in this country. These remarks apply, especially, of course, to jute and ramie. The handling of flax on this coast seems to need only the enlistment of capital, and for a considerable amount of cotton a market is already provided by the California Cotton-Mills at East Oakland, which are now using Texas cotton. We offer the following fiber seeds:

*Flax*.—Four varieties of the best European fiber flaxes, which attain about twice the length of stem of the variety grown for seed in this State: No. 1, White-flowering French; No. 2, Royal of Germany; No. 3, Russian; No. 4, Yellow-seeded. 4-oz. packages of each or all, 4c. each.

*Jute*.—A donation of jute seed imported by the late Wilson White has been placed at our

disposal. Jute should be grown away from the immediate coast on well-cultivated, moist but not wet land. The seed should be sown after the soil has become well warmed in the spring and the danger of frost is over. Under favorable conditions it makes a rapid growth. Seed in 4-oz. packages, 4c. each.

*Cotton*.—The warmer interior valleys of California have been shown by repeated experiments to be well adapted to the growth of cotton, and in thermal belts the plant has become perennial. As a commercial crop, however, it should be sown annually. As already stated, there is now a local market for cotton either ginned or unginned, and attention should be given to the crop by those especially who have home-help to do the picking. The demand of local manufacturers for California cotton is not wholly to avoid overland freight charges, but because of the intrinsic qualities of the California-grown staple. In the very careful tests of cotton from all the producing regions (see Report on Cotton Production, U. S. Census of 1880), it was shown that California Upland cotton stood first in length and strength of fiber; hence its desirability for the manufacture of seines, fishing-lines, etc., which require great strength and lightness, as well as for various cotton fabrics. We will send cotton-seed in 8-oz. packages, 6c. each.

*New Zealand Flax* (*Phormium tenax*).—Grows well in the coast regions of the State. Valuable for tying plants, vines, etc. Five plants to the lot; 25c. per lot by express.

*Esparto Grass* (*Stipa tenacissima*).—Grows well on sandy beaches within reach of salt water, and in some other situations. Used for cordage, basket-weaving and paper-making. Ten plants to the lot; 25c. per lot by express.

#### VEGETABLES.

*Beets*.—Two varieties of table beets received from the Department of Agriculture have proved very early and excellent, and are worthy of wider trial in this State. No. 1 "Eclipse," No. 2 "Osborns." Seed in small packets, 2c. each.

*Tungier Pea* (*Lathyrus tingitanus*).—This plant, which belongs to the sweet-pea class and not to the ordinary garden pea, yields a seed which, cooked as peas usually are, is very desirable for table use. The vines are also liked by cattle. Seed in 2-oz. packages, 2c. each.

#### MISCELLANEOUS.

*Dyer's Madder* (*Rubia Tinctoria*).—The report of the efficacy of ground madder root when applied to vine roots for phylloxera may induce some to grow the plant for experiment in that direction. The leaves are said to be good for forage. Seed in small packages, 2c. each.

*Pyrethrum* (Insect Powder plant).—The Dalmatian (*cinerariifolium*) and Red (*roseum*) in 1-oz packages, 2c. each.

*Bamboos*.—A few applicants can be furnished with rooted plants of the *Metake*, one in a lot; 25c. per lot by express.

N. B.—All applications for seeds and plants should be made as early as possible. We expect to send out seeds about January 1st, and PLANTS ABOUT FEBRUARY 1ST. All applications should be addressed to

December 5, 1889.

E. J. WICKSON,  
Berkeley, Cal.